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In the small clearings and settlements on the lakes a number of weeds and other introduced plants have appeared. This was an extremely interesting part of the flora to me, and I therefore made as full a list as possible of the species observed. The invading army was then small in number and few in species, but is likely here as elsewhere to more than hold its own as long as the clearings are open to the sun. I mention a few of these invaders to show how our common weeds travel in the footsteps of man:—*Ranunculus acris*; *Capsella Bursa-pastoris*; *Stellaria media*; *Spergula arvensis*; *Trifolium pratense*, and *T. repens*; *Sedum Telephium*; *Achillea Millefolium*; *Chrysanthemum Leucanthemum*; *Taraxacum officinale*; *Tanacetum vulgare*; *Cnicus arvensis* and *C. lanceolatus*; *Plantago major*; *Galeopsis Tetrahit*; *Polygonum Persicaria*; and *Rumex Acetosella*. All these species were collected at the Upper Dam, except *Spergula arvensis*, which was seen only at Indian Rock, some miles farther north. Most of them, however, appeared as well in other inhabited clearings, and often about the logging camps in the woods.

I have not spoken of the trees and shrubs, for the species observed were those that any one would expect to find in the northern woods. The whole region is much devastated by the lumbermen, and little pine have they left behind them. The poplar and the spruce are now being attacked, and I suppose in time this country will lose much of the wild beauty that is now one of its greatest charms.

EDWARD L. RAND.

### Notes on *Castilleja*.

By T. D. A. COCKERELL.

These singular plants, with their variously colored bracts and comparatively inconspicuous flowers, are very numerous in the West, and exceedingly variable. In Custer County, Colorado, we have at least three species—possibly more, while each one of these presents interesting varieties or forms. About West Cliff, rather below 8,000 feet alt., one finds in the meadows and on the prairies scarlet and pale yellow species. The scarlet-bracted species, which grows mainly on dry land, is *C. integra*, Gray; the other taller, and with pale yellowish bracts, is *C. pallida*

var. *acuminata*.\* This latter species prefers damper ground, and affords food for certain Lepidopterous larvæ. Leaving the open ground, we may now ascend to about 8,200 feet, where the pine timber begins at the base of the Sangre de Cristo Range. We at once meet with a different form, which is rather like *integra*, but taller and more slender, and otherwise peculiar. Failing to fit it with any known species, I will call it for the present *C. integra* var. *gracilis*.† This is the first sign of increase of altitude, which, added to the effect of the timber, with moisture and shade, has produced this taller form with deeply incised bracts.

Let us now follow up Brush Creek, one of the mountain streams. Up to over 10,000 feet we meet with nothing new, until, on a dry aspen-covered slope, appears a third scarlet-bracted form, *Castilleia linariæfolia*, Benth. *C. integra* var. grows at the same place, and can be distinguished from it at a glance. We will call this *C. linariæfolia* form (a.) *coccinea*, as the species is not always of this color. So we go on higher, and at about 11,000 feet is another stranger—when first I saw it, I did not even guess what it might be. But an examination in the hand, and a comparison with the *C. linariæfolia* I had gathered lower down, soon settled the matter—it was a form ‡ of *linariæfolia* with bright crimson 5-parted bracts. How strange, to find a species abundantly at one altitude, and uniformly scarlet, and to ascend perhaps 800 feet in the same gulch, and find it again—but crimson! It was one of the most striking things in variation I had ever seen, but shortly it was to be outdone in the same genus.

Close to where I had found the crimson *linariæfolia*, I came across a little family of *Castilleias* growing on a space of about two feet square—*C. pallida* forms, evidently. There were three varieties or forms, all intergrading beautifully at that very spot;

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\* *C. pallida acuminata* (Pursh), Britt.=*C. pallida septentrionalis*, Gray; Coult. Man. p. 284.

† CASTILLEIA INTEGRÆ GRACILIS: About 2 feet high, tomentose puberulent: Leaves rather inclined to be scabrous. Stem slender, erect, strong, somewhat tinged with purple. Leaves narrow, lanceolate, conspicuously 3-nerved, entire: lower cauline 58 mill. long and 9½ broad. Bracts tomentose, 3-parted, the divisions (the middle one largest) bright scarlet. Calyx about equally cleft before and behind or rather more before. Galea exerted, shorter than tube of corolla. Lip tricallos. Described from fresh specimens. Willow Creek, Custer Co., Colo., Aug. 3, 1889.

‡ *C. linariæfolia* f. *rosea* f. nov.

though perhaps if one of each had been shown to a botanist who knew nothing of variation in this genus and had never seen the intermediates, he would unhesitatingly have classed them as species. Two of the forms fell under the general definition of *C. pallida* var. *occidentalis*, Gray, having the bracts white-tipped. The first, most like ordinary *acuminata* of the valley, I will call f. *lobata*. The bracts are mostly 3-lobed, pale greenish, white at ends. The upper leaves have lateral lobes. The second may be named f. *tincta*, showing as it does the first indication of crimson-purple in this species. The lip is scarcely half the length of the galea; the bracts are broad, 5-lobed or cut and tinged with purplish. They are white at the ends. The leaves are entire. These two forms, although peculiar enough, are recognizable as varieties of *pallida*. But growing with them we have the third, a shorter crimson-purple bracted plant, as different from *acuminata* as can well be—the variety *Haydeni* of Gray. With the intermediate forms growing all together, one can see how *Haydeni* may be really a variety of *pallida*; and yet compare typical *Haydeni* with typical *acuminata* of the valley, and the relation seems almost impossible. One plant tall, with pale bracts and entire leaves—the other small, its inflorescence depressed, its bracts purple, and its leaves often much divided! It is possible, too, as one must admit, that the supposed intermediate forms *lobata* and *tincta* are really hybrids, which from reversion and variability are different in their characters. Yet *C. linariæfolia* has shown how scarlet may change to crimson without any hybridization being anyway probable, and the variation of *Haydeni* from *acuminata* is after all only the usual variation of species in this genus, carried to extremes. But again, the two forms of *linariæfolia* do not intermix, while *Haydeni* and even *acuminata* itself grow together, which favors the idea of their being distinct as species. At timber line (12,000 feet alt.), *Haydeni* is abundant while *occidentalis* sparingly occurs, and even examples of *acuminata* which I could not distinguish from those of four thousand feet below. Above timber line, the mountain side is beautifully pink with *Haydeni* in wonderful profusion. When I sat down I gathered all I could hold in my hands without moving from my seat, but, unfortunately, when pressed, they lose most

of their natural beauty. On the whole, though *Haydeni* is certainly descended from *pallida*, I think we may call it a species, *Castilleia Haydeni* (Gray), while the *lobata* and *tincta* forms may be doubtfully referred to *occidentalis*  $\times$  *Haydeni*—if *occidentalis* is not itself the hybrid. I feel exceedingly doubtful about this conclusion, nevertheless, for it seems to imply more free hybridization than is common.

However, hybrids or otherwise, the whole series of Custer County *Castilleias* shows us very plainly the effect of altitude in this genus. It acts in changing scarlet to crimson or purple, and in dividing the leaves and bracts. At extreme high altitude, dwarfing also is apparent, but this is mainly the effect of want of shelter.

### A New North American Aster.

(Plate C.)

ASTER TORREYI. Stem erect, rather stout, apparently 2 to 3 feet high, reddish, puberulent; cauline leaves broadly ovate, tapering to the base, conspicuously veined, and scabrous beneath, sharply serrate, the acute apex and the tips of the serratures apiculate-mucronate; upper ones smaller, inclined to be oblong and truncate at the base; inflorescence corymbose; heads numerous, crowded on the ends of the ascending branches; bracts of the involucre ovate, obtuse, imbricated in several rows, scarious in the center, and green on the tips and along the margins, the inner slightly tinged with purple, woolly-ciliate; rays about 4 lines long; akenes sparsely hirsute.

It belongs to the same group which includes *A. Engelmanni* and *A. elegans*, and has heads of flowers much like those of the latter in all respects, although the involucre bracts are somewhat broader and more obtuse.

The single specimen from which this description is drawn was collected in 1865, by Dr. John Torrey, on a high mountain near Donner Pass, in California. Remaining in his herbarium until now, without a name, it must have been overlooked by Dr. Gray, when engaged in the study of the genus. It consists only of the upper half of the plant, of which a figure is here given, in the hope that the botanists of the Pacific Slope may be inspired to make diligent search for the re-discovery of a species so beautiful and well-marked.

THOS. C. PORTER.